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RECORDS OF MEETINGS.

Nine hundred and thirty-third Meeting.

OCTOBER 8, 1902. — STATED MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary announced that letters had been received from Arthur James Balfour and W. E. H. Lecky, acknowledging their election as Foreign Honorary Members; from the Chief of the Department of Liberal Arts, World's Fair, St. Louis, inviting the Academy to make an exhibit of the work of its members; and from the International Botanical Congress, regarding the organization of the session at Vienna in 1905. Letters from the Trustees of Princeton University, inviting the Academy to be represented by a delegate at the inauguration of Woodrow Wilson as President of the University, and from the Trustees and Faculties of Northwestern University, requesting the Academy to appoint one or more delegates to the installation of Edmund Janes James as President of the University, were referred to the Executive Committee.

Letters were also received announcing the death of H. von Wild and Gaetano Negri; the institution of a section of terrestrial magnetism and seismology at the Royal Meteorological Institute of the Netherlands; the reorganization of the National Museum at Buenos Ayres; inviting the President and Secretary to the Jubilee Meeting of the North of England Institute of Mining and Mechanical Engineers.

The Chair announced the following deaths: —

John Daniel Runkle, Class I., Section 1; Horatio Hollis Hunnewell, Class II., Section 2; Horace Gray, Class III., Section 1; Charles Greely Loring, Class III., Section 4, Resident Fellows.

John Wesley Powell, Class II., Section 1, Associate Fellow.

Hervé Auguste Etienne Albans Faye, Class I., Section 1; Heinrich von Wild, Class II., Section 1; Rudolf Virchow, Class II., Section 4, Foreign Honorary Members.

On the motion of the Corresponding Secretary, it was

Voted, To meet, on adjournment, on the 12th of November.

The following gentlemen were elected members of the Academy: —

Harry Walter Tyler, of Boston, to be a Resident Fellow in Class I., Section 1 (Mathematics and Astronomy).

Alfred Edgar Burton, of Boston, to be a Resident Fellow in Class I., Section 4 (Technology and Engineering).

Hugo Münsterberg, of Cambridge, to be a Resident Fellow in Class III., Section 1 (Philosophy and Jurisprudence).

Frederic Jesup Stimson, of Boston, to be a Resident Fellow in Class III., Section 1.

Arthur Twining Hadley, of New Haven, to be an Associate Fellow in Class III., Section 3 (Political Economy and History).

Luigi Cremona, of Rome, to be a Foreign Honorary Member in Class I., Section 1 (Mathematics and Astronomy), in place of the late Charles Hermite.

Joseph John Thomson, of Cambridge, to be a Foreign Honorary Member in Class I., Section 2 (Physics), in place of the late Marie Alfred Cornu.

Emil von Behring, of Marburg, to be a Foreign Honorary Member in Class II., Section 4 (Medicine and Surgery).

John Morley, of London, to be a Foreign Honorary Member in Class III., Section 3 (Political Economy and History).

The President gave an account of his explorations of the coral reefs of the Maldives.

H. Helm Clayton read a paper entitled "On the Observed Movements of the Dust from the Volcanic Eruptions in the West Indies."

Edward Atkinson, in presenting the first two copies of a complete report issued by the Experiment Station in Insurance Engineering on Diffusion of Light and Corrosion of Steel, said:

"In our practice as underwriters we are called upon to deal with heat and light from a very different point of view as compared to that of pure science. In order to be prepared for questions in the future on so-called fire-proof construction, corrosion, and other matters, I have called upon my clients in the Factory Mutual Companies to assess themselves at the rate of one cent per hundred dollars of their insurance and to place in my hands a sum of money to be expended in what I have named the Insurance Engineering Experiment Station. In response I have received between fifteen thousand dollars ($15,000) and sixteen thousand dollars ($16,000), in spending which I have a free hand: but I have placed myself under an Advisory Committee consisting of the Directors of the Insurance Company of which I am President; chiefly under the advice of the Executive Committee, Messrs. Arthur T. Lyman, Howard Stockton, and Theophilus Parsons.

"We are about to have a sufficient area of land placed at our disposal on a long lease, and the representatives of various types of fire-proof construction are each to put up a building which shall be tested by fire and water and lapse of time, but which will also serve more than ample for our laboratories and experiments.

"All this is preliminary to laying out a course of instruction in Insurance Engineering and a year hence transferring the control of the Station to the Institute of Technology.

"In the interval if any members of the Academy want an opportunity to apply high temperature at or above the melting-point of cast-iron for a considerable period of time, we expect to have buildings of ten or twelve foot cube constructed for that purpose, and shall place them at their disposal.

"I will send to any member any reasonable number of copies of the report on the Diffusion of Light and the Corrosion of Steel on application by card addressed to my office, as we have issued a very large edition in order to interest men of Science, architects, and engineers in the general subject."

The following papers were presented by title: —

Contributions from the Harvard Mineralogical Museum.—XII. (1) "Babingtonite from Somerville, Mass." (2) "Babingtonite from Athol, Mass." By C. Palache and F. A. Fraprie. Presented by J. E. Wolff.

"On the Thermal Development of the Spark Spectrum of Carbon." By Henry Crew and John C. Baker. Presented by Charles R. Cross.

Nine hundred and thirty-fourth Meeting.

NOVEMBER 12, 1902. — ADJOURNED STATED MEETING.

VICE-PRESIDENT TROWBRIDGE in the chair.

The Corresponding Secretary announced that letters had been received from Hugo Münsterberg, F. J. Stimson, H. W. Tyler, accepting Resident Fellowship; Arthur T. Hadley, acknowledging election as Associate Fellow; E. v. Behring, John Morley, acknowledging election as Foreign Honorary Members; C. A. Young, accepting his appointment as representative of the Academy at the inauguration of the President of Princeton University; T. C. Chamberlin, accepting his appointment as delegate of the Academy at the installation of the President of Northwestern University; the Royal Academy of Sciences of Turin, announcing the death of its President, Alfonso Cossa; the Central Meteorological Institute of Sweden, announcing the death of its former Director, Robert Rubenson; and the Nobel Committee for Chemistry and the Nobel Committee for Physics of the Royal Academy of Sciences of Sweden, inviting competition for the Nobel prizes for 1903.

The following papers were presented: —

"The Fall of the Campanile of San Marco." By Arlo Bates.

"Recent Studies of the Lunar Surface." By William H. Pickering.

The Committee of Publication reported the acceptance of the following articles since the Annual Meeting: —

Contributions from the Chemical Laboratory of Case School of Applied Science. — XLII. "An Apparatus for Continuous Vacuum Distillation." By Charles F. Mabery.

Contributions from the Gray Herbarium of Harvard University. New Series. — No. XXIV. (Papers from the Hopkins-Stanford Expedition to the Galapagos Islands.) By B. L. Robinson. I. — "Flora of the Galapagos Islands."

Contributions from the Chemical Laboratory of Harvard College. "Concerning Gas-Analysis by Measurement in Constant Volume under Changing Pressure." By Theodore William Richards.

Contributions from the Chemical Laboratory of Case School of Applied Science. — XLIV. "A Method for Determining the Index of Refraction of Solid Hydrocarbons with the Pulfrich Refractometer. Index of Refraction of the Solid Hydrocarbons in Petroleum." By Charles F. Mabery and Lee Shepherd.

Contributions from the Chemical Laboratory of Harvard College. "The Significance of Changing Atomic Volume. III. The Relation of Changing Heat Capacity to Change of Free Energy, Heat of Reaction, Change of Volume, and Chemical Affinity." By Theodore William Richards.

Contributions from the Chemical Laboratory of Harvard College. "The Speed and Nature of the Reaction of Bromine upon Oxalic Acid." By Theodore William Richards and Wilfred Newsome Stull.

Contributions from the Chemical Laboratory of Harvard College. "The Range and Invariability of Faraday's Law." By Theodore William Richards and Wilfred Newsome Stull.

Contributions from the Chemical Laboratory of Harvard College. "An Apparatus for the Measurement of the Expansion of Gases by Heat under Constant Pressure." By Theodore William Richards and Kenneth Lamartine Mark.

Contributions from the Chemical Laboratory of Harvard College. "The Transition Temperature of Sodic Sulphate referred anew to the International Standard." By Theodore William Richards and Roger Clark Wells.

Nine hundred and thirty-fifth Meeting.

DECEMBER 10, 1902.

The PRESIDENT in the chair.

The Corresponding Secretary read letters from L. Cremona and J. J. Thomson, acknowledging their election as Foreign Honorary Members; and from the Entomological Society of Belgium, announcing the death of its President, Pierre-Jules Tosquinet.

The President announced the following deaths: —

Henry Mitchell, Resident Fellow in Class I., Section 1.

Ogden Nicholas Rood, Associate Fellow in Class I., Section 2.

Alfred Richard Cecil Selwyn, Associate Fellow in Class II., Section 1.

The following papers were presented: —

"Results obtained from the Use of Quartz Geissler Tubes in Spectrum Analysis." By John Trowbridge.

"A Theory of Tone-Relations — Colors, Intensities, Neutrality, Values." By Denman W. Ross.

The following paper was presented by title: —

"The Pressure due to Radiation." By E. F. Nichols and G. F. Hull. Presented by C. R. Cross.

Nine hundred and thirty-sixth Meeting.

JANUARY 14, 1903. — STATED MEETING.

VICE-PRESIDENT TROWBRIDGE in the chair.

On the motion of the Recording Secretary, it was

Voted, To meet on adjournment on the second Wednesday in February.

On the recommendation of the Rumford Committee, it was

Voted, To appropriate from the income of the Rumford Fund one hundred dollars ($100) for the preparation of a catalogue of the books on light and heat in the library of the Academy.

Voted, To transfer the appropriation of seven hundred and fifty dollars ($750), granted to Theodore W. Richards at the annual meeting of 1902, toward the prosecution of researches on the thermodynamical properties of chemical substances involved in chemical reactions.

Voted, To appropriate three hundred dollars ($300), from the income of the Rumford Fund to George E. Hale, of the Yerkes Observatory, for the purchase of a Rowland concave grating to be used in the photographic study of the spectra of the brightest stars.

On the motion of E. L. Mark, with the written approval of the Committee of Finance, it was

Voted, To appropriate from the income of the General Fund two hundred and fifty dollars ($250) for publishing.

The following papers were read: —

" Account of some Lunar phenomena." By N. S. Shaler.

"Some Recent Studies on Immunity." By W. T. Councilman.

The following papers were presented by title: —

" Mendel's Law of Heredity." By W. E. Castle.

" Synopsis of the Genus Lonicera." By Alfred Rehder. Presented by E. L. Mark.

" On the Temperature Coefficient of Chilled and Seasoned Cast Iron Magnets." By B. O. Peirce.

Nine hundred and thirty-seventh Meeting.

February 11, 1903. — Adjourned Stated Meeting.

Vice-President Walcott in the chair.

The Chair announced the following deaths : —

Morrill Wyman, of Class I., Section 4; James Elliot Cabot, of Class III., Section 4, Resident Fellows.

Sir George Gabriel Stokes, Baronet, of Class I., Section 2, Foreign Honorary Member.

Harold C. Ernst read a paper entitled, " A New Method of Stating Ehrlich's Theory of Immunity."

The following paper was presented by title : —

" Diffusion, Supersaturation, and the Metastable Limit." By Harry W. Morse and George W. Pierce. Presented by John Trowbridge.

Nine hundred and thirty-eighth Meeting.

MARCH 11, 1903. — STATED MEETING.

The RECORDING SECRETARY in the chair.

The Chair announced the death of Gaston Bruno Paulin Paris, Foreign Honorary Member in Class III., Section 4.

The Chair appointed the following councillors to serve as Nominating Committee: —

Charles R. Sanger, of Class I., Theobald Smith, of Class II., A. Lawrence Lowell, of Class III.

The following persons were elected members of the Academy:

George Ashley Campbell, of Boston, to be a Resident Fellow in Class I., Section 2 (Physics).

Albert Sauveur, of Cambridge, to be a Resident Fellow in Class I., Section 4 (Technology and Engineering).

Samuel Franklin Emmons, of Washington, to be an Associate Fellow in Class II., Section 1 (Geology, Mineralogy, and Physics of the Globe), in place of the late Clarence King.

Alfred Thayer Mahan, of New York, to be an Associate Fellow in Class III., Section 3 (Political Economy and History).

Karl Alfred Ritter von Zittel, of Munich, to be a Foreign Honorary Member in Class II., Section 1 (Geology, Mineralogy, and Physics of the Globe), in place of the late Friherre Adolf Erik Nordenskiöld.

The following papers were read: —

"The Pompeian Fresco called 'The Judgment of Solomon.'" By Morris H. Morgan.

"Origin of the Great Mountain Ranges." By William M. Davis.

Nine hundred and thirty-ninth Meeting.

APRIL 8, 1903.

The Academy met in the Geological Lecture Room of the Harvard University Museum, Cambridge.

The PRESIDENT in the chair.

In the absence of the Recording Secretary, W. M. Davis was appointed Secretary *pro tempore.*

The Chair announced the death of Henry Barker Hill, Resident Fellow in Class I., Section 3.

The following papers were presented by title: —

"On Families of Curves which are the Lines of Certain Plane Vectors either Solenoidal or Lamellar. By B. O. Peirce.

"On the Thermal Conductivities of Certain Pieces of Rock from the Calumet and Hecla Mine." By B. O. Peirce.

Contributions from the Gray Herbarium. New Series, No. XXV. "A Revision of the Genus Flaveria." By J. R. Johnston. Presented by B. L. Robinson.

"Spectra of Gases and Metals at High Temperatures." By John Trowbridge.

The grounds for the award of the Rumford Premium to George E. Hale, of the Yerkes Observatory, were stated by Charles R. Cross, chairman of the Rumford Committee. The medals were presented by the President, and Professor Hale responded, illustrating his recent researches in solar and stellar physics with projections on the screen.

The following exhibits in the adjoining halls of the Museum were then inspected: —

"Demonstration of some Phenomena of Optical Mineralogy." By J. E. Wolff.

"Photomicrographic Illustrations of North American Woods." By E. C. Jeffrey.

"The Soltwedel Plates of Sugar Cane." By G. L. Goodale.

"Plant Dissections, Illustrating the Study of Herbarium Specimens." By B. L. Robinson.

"Some Recent Discoveries in the New England Flora." By M. L. Fernald.

"A Method of Keeping Ornithological Notes." By William Brewster.

"Types of Indian Basketry." By F. W. Putnam and W. C. Willoughby.

"Phonograph Records of Indian Songs and Note Books of Indian Languages." By R. B. Dixon.

"Model of the Cahokia Mound Group." By F. W. Putnam and D. I. Bushnell, Jr.

"Illustrations of the Effects of the Earth's Rotation." By W. M. Davis.

"Selected Views from the Gardner Collection of Geological and Geographical Photographs." By P. S. Smith.

"Specimens of Fossil Brachiopods showing Details of Structure." By R. T. Jackson.

"A Two-Circle Goniometer, and a Collection of Cleaved Mineral Forms." By C. Palache.

"Rocks and Coals from the Rhode Island Coal Field, and other Specimens." By J. B. Woodworth.

"Recent Meteorological Charts and Atlases." By R. DeC. Ward.

"Cuspate Capes of our Atlantic Coast." By M. A. Read.

"Recent Folios of the Geologic Atlas of the United States." By L. Laforge.

"Thin Sections and Microphotographs of North American Woods." By E. C. Jeffrey.

"Contributions from the Cryptogamic Laboratories." By R. Thaxter.

Nine hundred and fortieth Meeting.

Annual Meeting. — May 13, 1903.

Vice-President Walcott in the chair.

The following letters were read: —

From Albert Sauveur, accepting Fellowship; S. F. Emmons, A. T. Mahan, acknowledging election as Associate Fellows; Ed. Mazelle, announcing his appointment as Director of the Astronomical-Meteorological Observatory of Trieste.

The Chair announced the following deaths: —

William Sumner Appleton, Resident Fellow in Class III., Section 2; Josiah Willard Gibbs, Associate Fellow in Class I., Section 2.

The annual report of the Council was read by the Recording Secretary.

In the unavoidable absence of the Treasurer, and at his request, the Recording Secretary read the annual report of the Treasurer, of which the following is an abstract: —

General Fund.

Receipts.

Balance, April 30, 1902		$272.42
Investments	$5,824.68	
Assessments	985.00	
Admission fees	50.00	
Sales of publications	81.84	6,941.52
		$7,213.94

Expenditures.

General expenses		$2,916.42
Publishing	$2,962.86	
Library	1,200.83	
Catalogue	104.70	4,268.39
Balance, April 30, 1903		29.13
		$7,213.94

Rumford Fund.

Receipts.

Balance, April 30, 1902		$ 381.96
Investments	$2,651.31	
Sale of publications	4.07	2,655.38
		$3,037.34

Expenditures.

Researches	$2,015.00	
Medals	331.50	
Publishing	323.11	
Library	154.07	
Miscellaneous	15.87	$2,839.55
Balance, April 30, 1903		197.79
		$3,037.34

Warren Fund.

Receipts.

Balance, April 30, 1902		$ 760.72
Investments	$1,030.19	
Appropriation refunded	130.66	1,160.85
		$1,921.57

Expenditures.

Investigations	$ 760.00
Balance, April 30, 1903	1,161.57
	$1,921.57

Building Fund.

Receipts.

Balance, April 30, 1902	$ 689.55
Investments	665.37
	$1,354.92

Expenditures.

Income invested and transferred to capital account	$1,250.00
Balance, April 30, 1903	104.92
	$1,354.92

The following reports were also presented: —

Report of the Librarian.

The card-catalogue has been continued by the Assistant Librarian, who has type-written 2615 cards, making the total number of cards 6300. All the books on light and heat, constituting with periodicals not yet catalogued, the Rumford Library, have been catalogued, besides the books on chemistry, engineering, the useful arts and general natural history, and some 200 books on miscellaneous subjects. The usual appropriation of $100 from the income of the General Fund is requested for continuing this work, and $50 is requested from the income of the Rumford Fund for the same purpose.

The accessions during the year have been as follows: —

	Vols.	Parts of vols.	Pams.	Maps.	Total.
By gift and exchange . . .	507	2155	249	24	2935
By purchase — General Fund	35	512			547
By purchase — Rumford Fund	22	251	2		272
Total	564	2918	251	24	3757

21 volumes and 2 pamphlets on light and heat, recommended by the Rumford Committee, were bought at an expense of $68.96.

. . . .

The expenses charged to the Library are as follows: — Miscellaneous, which includes expenses in no way related to the Library, $602.27; Binding, $324.02, General, and $40.23, Rumford Funds; Subscriptions, $274.54, General, and $113.94, Rumford Funds; making a total of $1200.83 for the General and $154.07 for the Rumford Funds. An appropriation of $1400 from the income of the General Fund is requested in addition to the customary appropriation of $150 from the income of the Rumford Fund for the purchase of books and periodicals.

A. Lawrence Rotch, *Librarian.*

Report of the Rumford Committee.

At the last Annual Meeting of the Academy, May 4, 1902, the sum of $1000 was placed at the immediate disposition of the Committee for use in furtherance of research. During the year which has elapsed since that date, the following grants have been made from this appropriation.

Dec. 10, 1902. One hundred and fifty dollars to Dr. Ralph S. Minor of Little Falls, N. Y., in aid of his research on the dispersion and absorption of substances for ultra-violet radiation.

Jan. 14, 1903. One hundred dollars to Dr. Sidney D. Townley of Berkeley, California, for the construction of a stellar photometer of the type devised by Professor Pickering.

Jan. 14, 1903. Two hundred dollars to Professor E. B. Frost for the construction of a special lens for use in connection with the stellar spectograph of the Yerkes Observatory to aid in the study of the radial velocities of faint stars.

Jan. 14, 1903. Two hundred and fifty dollars to Professors E. F. Nichols and G. F. Hull of Dartmouth College, in aid of their investigation on the relative motion of the earth and the ether by the method of Fizeau's polarization experiment. It was subsequently voted (April 8, 1903), to allow the grantees to change the application of this grant to an investigation of the effect of the motion of the earth on the intensity of radiation.

Feb. 11, 1903. One hundred and fifty dollars to Professor E. C. Pickering for the construction of two stellar photometers to be placed at the disposal of the Committee. It was furthermore voted that one of these be placed at the disposal of the Rev. Edmund Goetz, Director of the Southern Station of the Georgetown College Observatory.

The following votes have also been passed by the Committee: —

Dec. 10, 1902. That the Academy be recommended to appropriate one hundred dollars from the income of the Rumford Fund for the preparation of a catalogue of the books on light and heat in the library of the Academy, this being the second appropriation for the purpose.

Jan. 14, 1903. To recommend to the Academy the transfer of the appropriation of seven hundred and fifty dollars voted to Professor Theodore W. Richards at the Annual Meeting of 1902, toward the prosecution of an extended series of researches on the thermo-dynamics of substances involved in chemical reactions.

Jan. 14, 1903. To recommend to the Academy the appropriation of three hundred dollars from the income of the Rumford Fund to Professor George E. Hale of the Yerkes Observatory for the purchase of a Rowland concave grating to be used in the photographic study of the spectra of the brighter stars.

These recommendations were acted upon favorably by the Academy.

April 8, 1903. To request the Academy to appropriate from the income of the Rumford Fund the sum of seventy-five dollars to Mr. F. L. Bishop of the Bradley Polytechnic Institute in aid of his investigation on the thermal conductivity of lead; and also to appropriate the sum of two hundred dollars to Professor Frederick A. Saunders of the Syracuse University in aid of an investigation on the characteristics of the spectra produced under varying conditions, as specified in his application.

Feb. 11, 1903. To ask the Academy to appropriate from the income of the Rumford Fund the sum needed to purchase and bind certain books upon light and heat.

April 8, 1903. To ask the Academy to appropriate from the income of the Rumford Fund the sum of one hundred and fifty dollars for the purchase and binding of periodicals.

April 8, 1903. To request the Academy to appropriate the sum of one thousand dollars from the income of the Rumford Fund for the immediate needs of the Committee in furtherance of research.

May 13, 1903. To request the Academy to appropriate from the income of the Rumford Fund the sum of fifty dollars for cataloguing books and periodicals in the library of the Academy relating to light and heat.

Reports upon the progress of investigations aided by grants from the Rumford Fund have been received from Messrs. A. L. Clark, E. B. Frost, G. E. Hale, F. A. Laws, R. S. Minor, E. F. Nichols, A. A. Noyes, E. C. Pickering, T. W. Richards, S. D. Townley, R. W. Wood.

The Committee has considered the claims of a number of persons for the Rumford Premium but has decided to make no recommendation for an award this year.

Chas. R. Cross, *Chairman.*

Report of the C. M. Warren Committee.

The C. M. Warren Committee has the honor to report that Professor Mabery and Professor A. A. Noyes have reported satisfactory progress in the work assisted by grants from the Warren Fund.

They regret to be obliged to announce that Professor Charles L. Jackson, owing to pressure of work, felt obliged to resign the Chairmanship of the Committee.

Professor Leonard P. Kinnicutt was elected Chairman to fill the vacancy caused by Professor Jackson's resignation.

The Committee recommends the following appropriations from the income of the C. M. Warren Fund: —

To Professor C. F. Mabery, Case School of Applied Science, Cleveland, O., to complete his researches on petroleum, for which work he has already received various grants from the C. M. Warren Fund, three hundred dollars.

To Professor H. O. Hofman, Massachusetts Institute of Technology, Boston, Mass., to complete his research on the decomposition of zinc sulphate, for which work one hundred and sixty dollars was granted last year, three hundred and fifty dollars.

To Dr. Samuel P. Mulliken, Massachusetts Institute of Technology, Boston, Mass., to assist him in continuing his investigation on a systematic procedure for the identification of compounds of carbon containing hydrogen, nitrogen, and oxygen; Professor C. L. Jackson dissenting, five hundred dollars.

Leonard P. Kinnicutt, *Chairman.*

REPORT OF THE COMMITTEE OF PUBLICATION.

The Committee of Publication begs leave to report that there have been published during the academic year 1902–3, one Memoir, Vol. V., No. 12; two numbers of Volume XXXVII. of the Proceedings, and the first twenty-three numbers of Volume XXXVIII., aggregating 812 pages and 7 plates.

Eight numbers of Volume XXXVIII. (Nos. 7, 10, 12, 14, 15, 19, 20, and 23), in all 138 pages, were printed at the cost of the Rumford Fund ($487.52). The total expenditure for printing — including $12.00 for binding — paid from the General Fund was $2962.86.

The unexpended balance May 14, 1902, was $443.00. The appropriation made at the annual meeting on that date was $2400.00. An additional appropriation of $250.00 was made Jan. 14, 1903, and the return from sales was $81.84. The total amount from the General Fund available for publication was therefore $3174.84. The unexpended balance is $211.98.

The Committee recommends for the year 1903–4 an appropriation of $2600.00.

For the Committee,
E. L. MARK, *Chairman.*

May 13, 1903.

On the recommendation of the Committee of Finance, it was

Voted, To make the following appropriations from the income of the General Fund for the expenditures of the Academy during the ensuing year: —

For general expenses		$3000
For publishing		2400
For the library		
Books and binding	$900	
Miscellaneous	500	
Catalogue	100	1500
		$6900

On the recommendation of the Rumford Committee, it was

Voted, To make the following appropriations from the income of the Rumford Fund: —

For the immediate needs of the Rumford Committee in furtherance of research, $1000.

For the purchase and binding of periodicals, $150.

For the purchase and binding of certain specified books on light and heat, $100.

For cataloguing books and periodicals in the library relating to light and heat, $50.

To F. L. Bishop, in aid of his investigation on the thermal conductivity of lead, $75.

To F. A. Saunders, in aid of his investigation on the characteristics of spectra produced under varying conditions, $200.

On the recommendation of the C. M. Warren Committee, it was

Voted, To make the following appropriations from the income of the C. M. Warren Fund: —

To C. F. Mabery, to complete his researches on petroleum, $300.

To H. O. Hofman, to complete his research on the decomposition of zinc sulphate, $350.

To S. P. Mulliken, to assist him in continuing his investigation on a systematic procedure for the identification of compounds of carbon containing hydrogen, nitrogen, and oxygen, $500.

On the motion of the Recording Secretary, it was

Voted, That the annual assessment for the ensuing year be five dollars ($5).

The annual election resulted in the choice of the following officers and committees: —

WILLIAM W. GOODWIN, *President.*
JOHN TROWBRIDGE, *Vice-President for Class I.*
HENRY P. WALCOTT, *Vice-President for Class II.*
JOHN C. GRAY, *Vice-President for Class III.*
WILLIAM M. DAVIS, *Corresponding Secretary.*
WILLIAM WATSON, *Recording Secretary.*
SAMUEL CABOT, *Treasurer.*
A. LAWRENCE ROTCH, *Librarian.*

Councillors for Three Years.

LEWIS J. JOHNSON, of Class I.
EDWARD H. BRADFORD, of Class II.
MORRIS H. MORGAN, of Class III.

Member of Committee of Finance.

Eliot C. Clarke.

Rumford Committee.

Erasmus D. Leavitt, Amos E. Dolbear,
Edward C. Pickering, Arthur G. Webster,
Charles R. Cross, Theodore W. Richards,
Elihu Thomson.

C. M. Warren Committee.

Charles L. Jackson, Arthur M. Comey,
Samuel Cabot, Robert H. Richards,
Leonard P. Kinnicutt, Henry P. Talbot.
Arthur Michael.

The Chair appointed the following standing committees: —

Committee of Publication.

Seth C. Chandler, of Class I., Edward L. Mark, of Class II.,
Crawford H. Toy, of Class III.

Committee on the Library.

William F. Osgood, of Class I., Samuel Henshaw, of Class II.,
Henry W. Haynes, of Class III.

Auditing Committee.

Henry G. Denny, William L. Richardson.

The following gentlemen were elected members of the Academy: —

Charles Palache, of Cambridge, to be a Resident Fellow in Class II., Section 1 (Geology, Mineralogy, and Physics of the Globe).

William Francis Ganong, of Northampton, to be a Resident Fellow in Class II., Section 2 (Botany).

Charles R. Lanman gave an account of "The Completion of Whitney's Critical Commentary on the Atharva-Veda and the Continuity of Scientific Progress."

The following papers were presented by title: —

Contributions from the Gray Herbarium of Harvard University. New Series. No. XXVI. "New and otherwise Noteworthy Angiosperms from New Mexico and Central America." By J. M. Greenman. Presented by B. L. Robinson.

"Binary Families in a Triply Connected Region, with Especial Reference to Hypergeometric Families." By D. R. Curtiss. Presented by M. Bôcher.

"An Explanation of the False Spectra from Diffraction Gratings. By Theodore Lyman.

"Viscosity of Gases." By J. L. Hogg. Presented by John Trowbridge.

"The Spectra of Gases and Metals at High Temperatures." By John Trowbridge.

"The Changeable Hydrolytic Equilibrium of Dissolved Chromic Sulphate." By Theodore William Richards and Frederic Bonnet, Jr.

"The Anomalous Dispersion, Absorption, and Surface Color of Nitroso-dimethyl-aniline." By R. W. Wood. Presented by C. R. Cross.

On the motion of the Recording Secretary, the following resolution was unanimously adopted: —

Resolved, That the Fellows of the American Academy desire to place upon record their grateful appreciation of the services of their retiring President, Alexander Agassiz, during the nine years in which he has presided over their deliberations.

A TABLE OF ATOMIC WEIGHTS

of Seventy-seven Elements.

Compiled in April, 1902, *from the most Recent Data.*

By Theodore William Richards.

Name.	Symbol.	Atomic Weight.	Name.	Symbol.	Atomic Weight.
Aluminium . .	Al	27.1	Molybdenum . .	Mo	96.0
Antimony . . .	Sb	120.0	Neodymium . .	Nd	143.6
Argon	A	39.92	Neon	Ne	19.94
Arsenic	As	75.0	Nickel	Ni	58.71
Barium	Ba	137.43	Niobium . . .	Nb = Cb	94.
Beryllium . . .	Be = Gl	9.1	Nitrogen . . .	N	14.04
Bismuth . . .	Bi	208.	Osmium . . .	Os	190.8
Boron	B	11.0	Oxygen (standard)	O	16.000
Bromine . . .	Br	79.955	Palladium . . .	Pd	106.5
Cadmium . . .	Cd	112.3	Phosphorus . .	P	31.0
Cæsium . . .	Cs	132.88	Platinum . . .	Pt	195.2
Calcium . . .	Ca	40.13	Potassium . . .	K	39.14
Carbon	C	12.001	Praseodymium .	Pr	140.5
Cerium	Ce	140.	Rhodium . . .	Rh	103.0
Chlorine . . .	Cl	35.455	Rubidium . . .	Rb	85.44
Chromium . .	Cr	52.14	Ruthenium . .	Ru	101.7
Cobalt	Co	59.00	Samarium ? . .	Sm	150.
Columbium . .	Cb = Nb	94.	Scandium . . .	Sc	44.
Copper	Cu	63.60	Selenium . . .	Se	79.2
“ Didymium ” .	Nd + Pr	142.±	Silicon	Si	28.4
Erbium	Er	166.	Silver	Ag	107.93
Fluorine . . .	F	19.05	Sodium	Na	23.05
Gadolinium . .	Gd	156. ?	Strontium . . .	Sr	87.68
Gallium . . .	Ga	70.0	Sulphur . . .	S	32.065
Germanium . .	Ge	72.5	Tantalum . . .	Ta	183.
Glucinum . . .	Gl = Be	9.1	Tellurium . . .	Te	127.5 ?
Gold	Au	197.3	Terbium ? . . .	Tb	160.
Helium	He	3.96	Thallium . . .	Tl	204.15
Hydrogen . . .	H	1.0076	Thorium ? . . .	Th	233. ?
Indium	In	114.	Thulium ? . . .	Tu	171. ?
Iodine	I	126.85	Tin	Sn	119.0
Iridium	Ir	193.0	Titanium . . .	Ti	48.17
Iron	Fe	55.88	Tungsten . . .	W	184.
Krypton . . .	Kr	81.7	Uranium . . .	U	238.5
Lanthanum . .	La	138.5	Vanadium . . .	V	51.4
Lead	Pb	206.92	Xenon	X	128.
Lithium . . .	Li	7.03	Ytterbium . . .	Yb	173.
Magnesium . .	Mg	24.36	Yttrium . . .	Yt	89.0
Manganese . .	Mn	55.02	Zinc	Zn	65.40
Mercury . . .	Hg	200.0	Zirconium . . .	Zr	90.6

NOTE.

The accompanying table of atomic weights is but little changed since last year. Cæsium is made 132 88 instead of 132.9; calcium, 40.13 instead of 40.1; iron, 55.88 instead of 55.9; hydrogen, 1.0076 instead of 1.0075; and nickel, 58.71 instead of 56.70. The value for cæsium is due to some work, as yet unpublished, of Richards and Archibald, and that for calcium is increased in accuracy because the recent investigation of Hinrichsen[*] supports the less recent Harvard value.[†] The other very small changes are due simply to slight differences in the interpretation of data already well known. The decimal might have been omitted from palladium, because this element may still be a whole unit in doubt; but it has been retained as a compromise.

The differences between the present table, that of the German Committee,[‡] and that of F. W. Clarke,[§] are diminishing year by year. Nevertheless to as many as twenty-eight elements out of the seventy-seven are given values in these three tables differing among themselves by over one tenth of a per cent; namely, the atomic weights of antimony, bismuth, cerium, columbium, fluorine, gadolinium, germanium, helium, hydrogen, lanthanum, magnesium, mercury, neon, osmium, palladium, platinum, potassium, samarium, scandium, selenium, tantalum, tellurium, thorium, thulium, tin, titanium, uranium, and zirconium. To this list of uncertain elements should be added erbium, gallium, glucinum, indium, terbium, tungsten, ytterbium, upon which the three tables agree only because of lack of data upon which to base a disagreement. Thus nearly half of the elements are still in doubt by at least one part in a thousand. This circumstance is not so much a reproof to the many earnest workers upon the subject, as an evidence of the great difficulty of some of the problems involved.

Three of the elements given in the list above should not properly be included among the uncertain values, namely, hydrogen, magnesium, and potassium. The first finds its way into the list because of the disregard of significant figures by the German Committee, and the second chiefly because Clarke has included in his calculation work upon magnesic oxide undoubtedly erroneous on account of the presence of included gases.[‖] The case of potassium is somewhat peculiar; for in spite of the great wealth of data concerning this element, Clarke assigns to it the value 39.11, while the German Committee chooses 39.15. The low value is chiefly due to very unsatisfactory data concerning potassic iodide. To me it seems that the most recent work of Stas is far more satisfactory than his earlier work or than the work of any one else, hence the value 39.14 has been assigned to potassium in the present table since its first publication. Careful analyses by E. H. Archibald and myself confirm this conclusion.

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[*] Hinrichsen, Zeitschr. phys. Chem., **39**, 311 (1901).

[†] Richards, Journ. Am. Chem. Soc., **22**, 72 (1900), also **24**, 374 (1902).

[‡] Landolt, Ostwald, and Seubert, Extra insertion in Berichte d. d. ch. Ges. 1902. Heft 1.

[§] F. W. Clarke, Journ. Am. Chem. Soc., **24**, 201 (1902).

[‖] Richards and Rogers, These Proceedings, **28**, 209 (1893).